

WHAT IS CLAIMED IS:

- 1           1.       A method, comprising:  
2           managing transmission of data through a plurality of adaptors connected to  
3           switches;  
4           sending through the adaptors at least one query to the switches connected to the  
5           adaptor to determine a status of external ports in each queried switch communicating  
6           with a network; and  
7           in response to determining from the at least one query that no external ports are  
8           operational in one non-operational switch, indicating not to transmit data to the adaptor  
9           connected to the non-operational switch.
  
- 1           2.       The method of claim 1, further comprising:  
2           maintaining a switch map including information associating the adaptors with the  
3           switch to which the adaptors connect and a status of the external ports on the switches;  
4           and  
5           updating the status of the external ports to the status determined from the at least  
6           one query.
  
- 1           3.       The method of claim 1, further comprising:  
2           indicating to transmit data to one adaptor connected to one switch having at least  
3           one operational external port in response to determining from the at least one query that  
4           at least one external port in the switch is operational when the switch was previously  
5           indicated as non-operational.
  
- 1           4.       The method of claim 3, further comprising:  
2           performing a failover to the switch that is operational from the switch that is non-  
3           operational in response to determining from the at least one query that one switch is non-  
4           operational; and  
5           performing a failback to the switch that is determined to have at least one  
6           operational external port when the switch was previously indicated as non-operational.

1           5.       The method of claim 1, wherein the adaptors are managed as a team and  
2 wherein load balancing operations are performed when transmitting data through the  
3 adaptors.

1           6.       The method of claim 1, wherein each adaptor is connected to a different  
2 switch to provide redundant paths to the network.

1           7.       The method of claim 1, wherein the operations of managing the  
2 transmissions of data, sending the at least one query and indicating not to transmit data to  
3 one adaptor is performed by an intermediate device driver executing in a server in  
4 communication with adaptor device drivers, wherein each switch and the server are  
5 implemented on different printed circuit boards, and wherein the server and switch  
6 printed circuit board are in a chassis.

1           8.       The method of claim 1, wherein the at least one query comprises an  
2 SNMP query of the external port link status.

1           9.       A system in communication with at least one switch, wherein the switch  
2 communicates with a network, comprising:  
3 a plurality of adaptors connected to the at least one switch;  
4 circuitry capable of causing operations, the operations comprising:  
5               (i) managing transmission of data through the adaptors;  
6               (ii) sending through the adaptors at least one query to the switches  
7 connected to the adaptor to determine a status of external ports in each queried  
8 switch communicating with the network; and  
9               (iii) in response to determining from the at least one query that no external  
10 ports are operational in one non-operational switch, then indicating not to transmit  
11 data to the adaptor connected to the non-operational switch.

1           10.    The system of claim 9, further comprising:  
2           a switch map including information associating the adaptors with the switch to  
3   which the adaptors connect and a status of the external ports on the switches, wherein the  
4   operations performed by the circuitry are further capable of updating the status of the  
5   external ports to the status determined from the at least one query.

1           11.    The system of claim 9, wherein the operations performed by the circuitry  
2   are further capable of:  
3           indicating to transmit data to one adaptor connected to one switch having at least  
4   one operational external port in response to determining from the at least one query that  
5   at least one external port in the switch is operational when the switch was previously  
6   indicated as non-operational.

1           12.    The system of claim 9, wherein the operations performed by the circuitry  
2   are further capable of:  
3           performing a failover to the switch that is operational from the switch that is non-  
4   operational in response to determining from the at least one query that one switch is non-  
5   operational; and  
6           performing a failback to the switch that is determined to have at least one  
7   operational external port when the switch was previously indicated as non-operational.

1           13.    The system of claim 9, wherein the adaptors are managed as a team and  
2   wherein load balancing operations are performed when transmitting data through the  
3   adaptors.

1           14.    The system of claim 9, wherein each adaptor is connected to a different  
2   switch to provide redundant paths to the network.

1           15.    The system of claim 9, wherein the circuitry for performing the operations  
2   of managing the transmissions of data, sending the at least one query and indicating not

3 to transmit data to one adaptor is implemented as an intermediate device driver, further  
4 comprising:  
5 at least one adaptor device driver in communication with the intermediate device  
6 driver managing communications to at least one adaptor.

1 16. The system of claim 9, further comprising:  
2 a chassis, wherein the switches are implemented on printed circuit boards in the  
3 chassis; and  
4 a printed circuit board in the chassis on which the circuitry and adaptors are  
5 implemented.

1 17. The system of claim 9, wherein the at least one query comprises an SNMP  
2 query of the external port link status.

1 18. A system in communication with a network, comprising:  
2 (a) a chassis;  
3 (b) a plurality of switch printed circuit boards capable of being inserted in the  
4 chassis;  
5 (c) a server printed circuit board capable of being inserted in the chassis, and  
6 including:  
7 (i) a plurality of adaptors connected to the switch printed circuit boards;  
8 (ii) circuitry capable of causing operations, the operations comprising:  
9 (A) managing transmission of data through the adaptors;  
10 (B) sending through the adaptors at least one query to the switch  
11 printed circuit boards connected to the adaptor to determine a status of  
12 external ports in each queried switch communicating with the network;  
13 and  
14 (C) in response to determining from the at least one query that no  
15 external ports are operational in one non-operational switch printed circuit  
16 board, then indicating not to transmit data to the adaptor connected to the  
17 non-operational switch printed circuit board.

1           19.    The system of claim 18, wherein the server printed circuit board further  
2 includes:

3           a switch map including information associating the adaptors with the switch to  
4 which the adaptors connect and a status of the external ports on the switches, wherein the  
5 operations performed by the circuitry are further capable of updating the status of the  
6 external ports to the status determined from the at least one query.

1           20.    An article of manufacture in communication with adaptors connected to  
2 switches, wherein the switches provide communication with a network, and wherein the  
3 article of manufacture is capable of causing operations to be performed, the operations,  
4 comprising:

5           managing transmission of data through the adaptors connected to the switches;  
6           sending through the adaptors at least one query to the switches connected to the  
7 adaptor to determine a status of external ports in each queried switch communicating  
8 with the network; and

9           in response to determining from the at least one query that no external ports are  
10 operational in one non-operational switch, then indicating not to transmit data to the  
11 adaptor connected to the non-operational switch.

1           21.    The article of manufacture of claim 20, wherein the operations further  
2 comprise:

3           maintaining a switch map including information associating the adaptors with the  
4 switch to which the adaptors connect and a status of the external ports on the switches;  
5 and

6           updating the status of the external ports to the status determined from the at least  
7 one query.

1           22.    The article of manufacture of claim 20, wherein the operations further  
2 comprise:

3           indicating to transmit data to one adaptor connected to one switch having at least  
4 one operational external port in response to determining from the at least one query that

5 at least one external port in the switch is operational when the switch was previously  
6 indicated as non-operational.

1 23. The article of manufacture of claim 22, wherein the operations further  
2 comprise:  
3 performing a failover to the switch that is operational from the switch that is non-  
4 operational in response to determining from the at least one query that one switch is non-  
5 operational; and  
6 performing a failback to the switch that is determined to have at least one  
7 operational external port when the switch was previously indicated as non-operational.

1 24. The article of manufacture of claim 20, wherein the adaptors are managed  
2 as a team and wherein load balancing operations are performed when transmitting data  
3 through the adaptors.

1 25. The article of manufacture of claim 20, wherein each adaptor is connected  
2 to a different switch to provide redundant paths to the network.

1 26. The article of manufacture of claim 20, wherein the operations are  
2 performed by an intermediate device driver in communication with adaptor device  
3 drivers.

1 27. The article of manufacture of claim 20, wherein the at least one query  
2 comprises an SNMP query of the external port link status.